

## MY WEIRD PROMPTS

Podcast Transcript

EPISODE #299

# The Master Cells: A Guide to Stem Cell Donation

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## EPISODE SYNOPSIS

When their housemate Daniel receives a life-changing email identifying him as a potential stem cell match, Herman and Corn take a deep dive into the fascinating world of hematopoietic stem cells and the "biological ID cards" known as HLA markers. This episode demystifies the donation process, explaining the difference between peripheral blood collection and bone marrow harvests while exploring how Israel's unique collaboration between the military and the Ezer Mizion registry has created a world-leading model for genetic diversity. It is a compelling look at how a few hours in a comfortable chair can provide a total "factory reset" for a patient in need, turning the complexities of cellular biology into a powerful story of human connection and hope.

## DANIEL'S PROMPT

### Daniel

I'd love to know the science behind stem cell donations. I assume it's for conditions like blood cancer, but if you join a registry and find a match for a stem cell and blood donation, what does that entail exactly? Scientifically, how does that help the patient? Tell us about stem cell donations, how they work in the Israeli context, and what the process entails for donors.

# TRANSCRIPT

## Corn

Hey everyone, welcome back to My Weird Prompts. I am Corn, and I am joined as always by my brother, the man who probably knows more about the internal workings of a white blood cell than any other person in Jerusalem.

## Herman

Herman Poppleberry, reporting for duty. And while that might be a slight exaggeration, Corn, I have spent a fair amount of time recently looking into precisely that. Especially after the news our housemate Daniel got this week.

## Corn

Yeah, it has been a wild week in the house. Between the ongoing saga of the apartment leaks and the general chaos of January twenty twenty-six, Daniel gets this email that stops him in his tracks. A hospital reached out saying he might be a match for someone in need of a stem cell donation.

## Herman

It is one of those moments that really puts things into perspective, right? You go through your day thinking about deadlines and broken pipes, and suddenly you get a message saying your biology might be the key to someone else's survival. It is the ultimate 'weird prompt' from the universe.

## Corn

It is incredible. Daniel was a bit nervous, naturally. He mentioned he did a saliva swab years ago—back when he was first starting university—and had almost forgotten about it. But now that it is potentially real, he wants to know the actual science. What are these cells? Why are they so special? And what does the process actually look like, especially here in Israel?

### Herman

I am so glad he asked. There is a lot of mystery and, frankly, some outdated fear around stem cell and bone marrow donation. People still think of those scenes in old medical dramas from the nineties with giant needles and painful surgeries, but the reality for the vast majority of donors today is much closer to a long afternoon in a comfortable chair with a good book.

### Corn

Let us start with the basics then. When we talk about stem cell donations for things like blood cancer, what kind of cells are we actually talking about? Because I know stem cells come in different varieties—like the ones in embryos we used to hear so much about in the news.

### Herman

Right, that is a crucial distinction. We are not talking about embryonic stem cells. We are talking about hematopoietic stem cells, or H S Cs. That is a mouthful, but it basically comes from the Greek words 'haema' for blood and 'poiesis' for 'to make.' These are the master cells, the architects of your entire blood and immune system. They live primarily in your bone marrow, which is that spongy tissue inside your larger bones like your hips and your sternum.

### Corn

So they are like the factory workers that produce everything else? Or maybe more like the foremen?

### Herman

They are the stem of the tree, hence the name. A single hematopoietic stem cell can divide and differentiate into every single type of cell found in the blood. We are talking red blood cells which carry oxygen, platelets which help your blood clot when you get a scrape, and the entire army of white blood cells—the neutrophils, the T-cells, the B-cells—that fight off infection. They are constantly regenerating. In a healthy person, this factory is humming along perfectly, producing billions of new cells every single day.

### Corn

But in the cases Daniel is looking at, the factory has broken down.

### Herman

Exactly. For someone with leukemia, lymphoma, or certain types of severe anemia, the factory has gone haywire. In leukemia, for example, the bone marrow starts churning out massive amounts of abnormal, immature white blood cells. These 'blast cells' don't work properly, and because there are so many of them, they crowd out the healthy cells. It is like a factory that stops making cars and starts making useless metal scraps that eventually block the entire assembly line.

### Corn

And that is where the donation comes in. You are essentially giving the patient a new set of factory workers?

### Herman

That is a great way to put it. You are providing a fresh, healthy population of these master cells that can move into the patient's bone marrow and start over. But before that can happen, the patient usually has to go through something called conditioning. This is the part people don't often see. They use high doses of chemotherapy or sometimes total body radiation to essentially wipe out their own diseased bone marrow. It is a process called myeloablation. It creates a total void.

### Corn

So it is a total reset. They clear the deck, and then they need the donor's cells to come in and rebuild the entire system from scratch. That sounds incredibly high-stakes. If the donor cells don't show up or don't work, the patient has no immune system at all.

### Herman

Precisely. It is a 'point of no return' procedure. And that is why the matching process is so critical. Daniel mentioned he was a potential match, and that is all about something called Human Leukocyte Antigens, or H L A. Most people are familiar with blood types, like A positive or O negative. But for stem cell transplants, blood type is actually secondary. H L A markers are proteins found on the surface of most cells in your body. Your immune system uses these markers as a sort of biological I D card to recognize which cells belong to you and which ones are intruders.

### Corn

So if the H L A markers do not match closely enough, the patient's body would see the new stem cells as an invading force?

### Herman

Or even worse, the new immune system created by the donor cells might see the patient's body as the intruder. That is called graft versus host disease, or G V H D, and it can be very dangerous. This is why we need such a precise match. We usually look at eight or ten specific H L A markers. The best chance for a match is typically a sibling, because you inherit half of your markers from each parent. But even then, there is only a twenty-five percent chance that a sibling will be a perfect match.

### Corn

Which explains why these massive registries exist. If you do not have a match in your family—which seventy percent of patients don't—you have to look at the rest of the world. It is like trying to find a genetic twin who isn't actually related to you.

### Herman

Exactly. And this is where the Israeli context becomes really fascinating. Daniel's swab went into a system that is actually world-renowned. Israel has one of the highest rates of registered donors per capita in the entire world. As of 2024, the Ezer Mizion registry has over one million people in it (with continued growth into 2026). For a country of about ten million, that is a staggering ratio.

### Corn

I remember hearing that. Is it because of the military recruitment process? I feel like every Israeli I know joined the registry when they were eighteen.

### Herman

That is the secret sauce. Since two thousand five, the Ezer Mizion organization, which was founded by Moti and Bracha Zisser, has collaborated with the Israel Defense Forces. When young Israelis go through their induction at the 'Bakum' recruitment center, they are given the option to give a simple saliva swab to join the registry. Because it is a moment of national service anyway, the 'opt-in' rate is incredibly high.

## Corn

It is such a smart move. You have a constant influx of young, healthy people entering the system every year. And because they are young, their stem cells are generally more 'robust,' right?

## Herman

Yes, clinical outcomes are generally better with younger donors. But it is not just about the numbers, Corn. It is about the genetic melting pot that is Israel. Because H L A markers are inherited, you are most likely to find a match with someone who shares your ancestral background. In Israel, we have people with roots from North Africa, Eastern Europe, the Middle East, Ethiopia, and Central Asia. This diversity makes the Israeli registry a global treasure. Ezer Mizion actually facilitates hundreds of transplants every year for people all over the world—from New York to Tokyo—because they might have that one specific Moroccan-Polish genetic combination that a patient needs.

## Corn

So, let us talk about what Daniel might actually have to do. He was worried about the process itself. He asked if it is like a blood donation. Is it?

## Herman

In about ninety percent of cases today, yes, it is very similar to a long blood donation. This process is called Peripheral Blood Stem Cell donation, or P B S C. In the past, the only way to get these cells was to go into the bone marrow directly, usually from the pelvic bone, while the donor was under general anesthesia. That still happens sometimes—about ten percent of the time—especially if the patient is a child, because studies show that for pediatric cases, actual bone marrow can sometimes lead to better outcomes.

## Corn

Okay, so if Daniel does the P B S C version, how do they get the stem cells out of his marrow and into his bloodstream? Because you said they usually live deep inside the bones.

### Herman

That is the clever bit. A few days before the donation, the donor gets a series of injections of a protein called G C S F, or granulocyte colony stimulating factor. In Israel, the most common brand name is Filgrastim. This protein is actually something your body produces naturally when you are sick or injured. It tells your bone marrow to go into overdrive and produce a massive amount of stem cells.

### Corn

And because there are so many, they start spilling out into the bloodstream?

### Herman

Exactly. They get pushed out into the peripheral blood. By the fourth or fifth day, the concentration of stem cells in the blood is high enough for collection. Now, Daniel should know that these shots can have some side effects. Most donors feel like they have a mild case of the flu. You might have some bone pain—especially in your back or hips—or a headache. This makes sense because your bone marrow is literally expanding and working overtime. It is a sign the medicine is working. But it is temporary. It goes away almost immediately after the donation.

### Corn

So he gets the shots for a few days, and then he goes to the hospital for the actual collection. What happens then? Does he just sit there with a needle?

### Herman

He sits in a very comfortable chair, usually for about four to six hours. They put a needle in each arm. Blood is drawn from one arm and goes into a machine called an apheresis machine. This is a specialized centrifuge that spins the blood at very high speeds. Because stem cells have a specific density—they are slightly different in weight than red cells or plasma—the machine can separate them out in real-time. It collects them in a bag, while the rest of the blood is returned to the donor through the other arm.

### Corn

So you are not actually losing much blood volume at all. You are just filtering out those specific master cells.

### Herman

Precisely. Your total blood volume stays almost the same. You can watch a movie, read a book, or chat with the nurses. By the end of it, you have a small bag of liquid that looks a bit like pinkish grapefruit juice. But that bag contains millions of life-saving cells. For the donor, the biggest challenge is usually just the boredom of sitting still for five hours.

### Corn

It is amazing that we have the technology to do that. It sounds so much less invasive than what people imagine. But what about that other ten percent? If they do need to go into the bone marrow, what does that look like in twenty twenty-six? Is it still the 'giant needle' horror story?

### Herman

It is a surgical procedure, but it is very routine. If Daniel were asked to do a marrow donation, he would be under general anesthesia. Doctors use a special needle to withdraw liquid marrow from the back of the pelvic bone. There are no stitches, just a couple of small punctures that are covered with bandages. The main thing there is that the donor might feel some soreness in their lower back for a few days, similar to a bruise or the feeling after a very intense workout at the gym. But again, your body replaces that marrow within a few weeks. It is a highly renewable resource.

### Corn

That is an important point. You aren't losing anything permanently. Your body just makes more. It is not like a kidney where you only have two and you are giving one away.

### Herman

Exactly. It is more like donating blood, just a more specialized version. You are giving away a surplus that your body is expertly designed to replace. In fact, your body starts replacing those cells the moment the donation is finished.

### Corn

So, once that bag of cells is collected—the 'pink grapefruit juice'—what happens next? I imagine time is of the essence.

### Herman

It is a literal race against the clock. Those cells are living tissue, and they start to lose viability the moment they leave the body. Usually, a specialized courier is waiting right there at the hospital. They put the cells in a temperature-controlled cooler and transport them directly to the patient. If the patient is in another country, that courier has special clearance to carry the bag onto the plane. They never let it out of their sight. They don't even put it through the X-ray machine at security because the radiation could damage the cells.

### Corn

I remember we talked about medical logistics in episode two hundred eighty-nine. The 'human courier' system is one of the few things that hasn't been replaced by drones yet because the stakes are just too high. You can't risk a drone crashing with the only match for a leukemia patient on board.

### Herman

Exactly. The goal is usually to have the cells infused into the patient within twenty-four to forty-eight hours. And the infusion itself? It is almost anti-climactic. It is just like a blood transfusion. They hook the bag up to an I V line, and the stem cells are dripped into the patient's bloodstream. Now, Corn, here is the part that always blows my mind. You might wonder, how do the cells know where to go? They are just floating in the blood.

### Corn

Yeah, I was going to ask that. Do they have a G P S? How do they find their way back into the inside of the bones?

### Herman

It is called 'homing.' It is a biological miracle. The stem cells have specific receptors on their surface that are attracted to chemical signals—specifically a protein called C X C L twelve—coming from the empty spaces in the bone marrow. They literally navigate through the circulatory system, exit the blood vessels in the marrow, and 'set up shop.' Within a couple of weeks, they start producing new, healthy blood cells. This is called engraftment.

## Corn

That is incredible. They just know where their home is. It is like they are returning to the mothership.

## Herman

It really is. And for the patient, that is the moment they start to get their life back. Their immune system begins to rebuild. They start making their own platelets again. It is a total biological rebirth. In many transplant wards, they actually celebrate the day of the infusion as the patient's 'new birthday.'

## Corn

I can see why Daniel is feeling the weight of this. It is a lot to process. One thing he mentioned was the anonymity. He knows it is a match, but he doesn't know who it is. How does that work in the Israeli system? Does he ever get to meet the person?

## Herman

In Israel, and in most international registries, the donation is completely anonymous for at least the first year. This is for the protection of both parties. You don't want the donor to feel a sense of 'ownership' over the patient, and you don't want the patient to feel an overwhelming debt they can never repay. During that first year, they can send anonymous letters through the registry. 'Dear Donor, I am walking again.' 'Dear Patient, I am thinking of you.'

## Corn

After a year, if both parties agree, they can choose to meet. I have seen those videos, Herman. They are the only things on the internet that still make me cry. Usually, it is a year or two later, and you see someone who was on the brink of death now healthy and vibrant, hugging the person who gave them those cells.

## Herman

It is powerful stuff. We actually discussed the ethics of medical anonymity back in episode two hundred forty-nine, but in this context, it is all about the 'gift of life' being unconditional. In Israel, these meetings are often televised because they serve as such a powerful recruitment tool for the registry. It reminds people that the saliva swab they did ten years ago actually meant something.

## Corn

You know, thinking about the Israeli context again, it strikes me how much this reflects the culture here. This sense of collective responsibility, or 'Areivut Hadadit.'

## Herman

It really does. There is a phrase often cited in this context from the Mishnah: 'Whoever saves a single life, it is as if he had saved the entire world.' In a small, tight-knit society like Israel, that isn't just a metaphor. People feel a very direct connection to one another. The fact that Ezer Mizion has built such a massive infrastructure—including their own specialized labs and collection centers—shows that this is a national priority.

## Corn

And it is worth noting that it isn't just for Jewish patients. The Israeli registry works with people of all backgrounds. There are huge efforts to increase registration in the Arab-Israeli community and among the Druze and Circassian communities.

## Herman

Absolutely. Because H L A markers are so tied to ethnicity, if an Arab-Israeli patient needs a match, their best hope is often within their own community. Ezer Mizion has been working hard to bridge those gaps, because at the end of the day, leukemia doesn't care about your politics or your religion. It is just biology.

## Corn

So, if someone is listening to this and they aren't on a registry yet, what is the actual hurdle? Is it just the swab?

## Herman

That is it. A simple cheek swab. You can often order a kit online—through Ezer Mizion here, or Be The Match in the U S, or Anthony Nolan in the U K. Once you are in the system, you stay there until you are about sixty years old. Most people will never be called. The chances of being a match for a stranger are about one in four hundred thirty. But if you are called, it means you are likely the only person on earth who can save that specific patient.

### **Corn**

That is a heavy thought. To be the only one. It is like being the only person with the key to a locked room where someone is trapped.

### **Herman**

It is. But as Daniel is finding out, it is also an incredible opportunity. The medical teams here in Israel are some of the best in the world at this. They walk the donors through every single step. There is a lot of psychological support as well, because it is a big deal. You are going from being a regular person to being a literal life-saver over the course of a week.

### **Corn**

So, for Daniel, if he goes forward with this, what is the recovery like for him? Say he does the P B S C donation, the one with the machine.

### **Herman**

Usually, he would be back to his normal routine within twenty-four to forty-eight hours. Most donors say they feel a bit tired for a day or two, maybe some lingering stiffness from sitting in the chair for so long. But the body is incredibly resilient. Those stem cells he donated? His body will have replaced them entirely within a few weeks. There are no long-term negative health effects for the donor that have been identified in decades of study. You aren't 'using up' your supply of stem cells. You have plenty to spare.

### **Corn**

That is really reassuring. I think the fear of the unknown is always the biggest hurdle. People hear 'bone marrow' and they think of something being taken away that they need for their own survival.

### **Herman**

Right. But it is more like being a gardener and taking some clippings from a very healthy, fast-growing plant to help someone else start their own garden. The original plant is fine. It might even grow back thicker. It is a win-win.

## Corn

I like that analogy. So, what are the actual success rates for the patients? I know it depends on the disease, but generally speaking, how much of a 'cure' is this?

## Herman

It has improved drastically. For many types of blood cancer, a stem cell transplant is now a curative treatment. We are talking about people who would have had no hope twenty or thirty years ago now living full, healthy lives. Success rates can be anywhere from fifty percent to over eighty percent depending on the specific condition and how early it is caught. And the closer the H L A match, the lower the risk of complications like G V H D, which is why Daniel being a potential match is so significant.

## Corn

It is amazing to think about the progress we have made. From those early, incredibly risky transplants in the nineteen fifties and sixties to this highly refined, almost routine process today. It is one of the great triumphs of modern medicine.

## Herman

It really is. And it is a perfect example of how basic biological research—understanding how cells divide and how the immune system recognizes 'self' versus 'non-self'—leads directly to saving lives. It is science at its most human.

## Corn

You know, we should probably mention that while the Israeli registry is huge, this is a global effort. If you are in the United States, you have the N M D P, which used to be called Be The Match. In the United Kingdom, there is Anthony Nolan and the N H S registry. They all talk to each other through a system called the World Marrow Donor Association.

## Herman

That is a crucial point. It is a global network. A donor in Haifa could be a match for a patient in Seattle. The cells are flown across oceans. It is one of the few areas where international cooperation is almost seamless, because everyone recognizes the stakes. It is a global safety net for humanity.

### Corn

Well, I think we have given Daniel a lot to chew on. It is a big decision, but the science is clear: it is a safe, highly effective way to do something truly extraordinary. It is the ultimate way to answer a 'weird prompt' from the universe.

### Herman

It really is. And Daniel, if you are listening to this while you are waiting for your next blood test, just know that you are already doing something amazing just by being willing to consider it. The world needs more people who are ready to answer that email.

### Corn

Absolutely. And for everyone else, if you haven't checked if you are on a registry, maybe today is the day. It takes five minutes and a cheek swab. You might never be called, but just being 'available' gives hope to thousands of families who are currently waiting for that match.

### Herman

And hey, if you found this deep dive helpful, or if you have your own stories about donation, we would love to hear them. You can always reach out through the contact form at [myweirdprompts.com](https://myweirdprompts.com). We read everything that comes in, even the technical questions about white blood cell counts.

### Corn

We really do. And while you are there, if you could leave us a review on your favorite podcast app—whether that is Spotify or Apple Podcasts—it genuinely helps other curious people find the show. We have been doing this for nearly three hundred episodes now, and the community of listeners is what keeps us going.

### Herman

It really does. Every review helps us climb those mysterious algorithms and reach people who might be looking for answers to their own weird prompts. Maybe the next person we help is someone else who just got a life-changing email.

**Corn**

Well, Herman, I think we have covered the bases here. From the master cells in our bones to the logistics of flying them across the world in a cooler, it is a pretty incredible system.

**Herman**

It is the best of humanity and the best of science working together. You can't ask for much more than that. It is a reminder that we are all connected, right down to the proteins on the surface of our cells.

**Corn**

Agreed. Thanks for the deep dive, Herman Poppleberry. And thanks to Daniel for sending in such a meaningful prompt this week. We are all rooting for you, man.

**Herman**

My pleasure, Corn. Good luck to Daniel, and to whoever that potential match might be. I hope they get their 'new birthday' very soon.

**Corn**

This has been My Weird Prompts. You can find all our past episodes and more at [myweirdprompts.com](https://myweirdprompts.com). We will be back next week with another exploration into the obscure, the technical, and the just plain weird.

**Herman**

Until next time, stay curious.

**Corn**

Bye everyone.